

New Record for the Hungarian Aphid Fauna

Smiela fusca Mordvilko, 1948

ZS. BASKY

Plant Protection Institute, Centre for Agricultural Research, Hungarian Academy of Sciences,
Herman Ottó u. 15, H-1022 Budapest, Hungary

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Survey of aphids on dicotyledonous herbaceous plants along the Hungarian highways on 33 sampling points revealed the presence of the rare cruciferous feeding aphid species *Smiela fusca* forming small colony on horse radish (*Armoracia rusticana*). *Smiela fusca* is not only a new record for the Hungarian aphid fauna, but we found *S. fusca* colonizing a new host species, *A. rusticana*.

Keywords: *Smiela fusca*, new host, *Armoracia rusticana*, Hungary.

In order eliminate the difference in level during motorway construction road bed construction requires levelling of the ground (Forman et al., 2002). During this procedure the natural vegetation is destroyed. If the levelling does not remove more than 15–20 cm of soil layer than the root layers can serve propagation purposes. It was observed in case of *Silene alba* (Mill.) E.H.L. Krause 1893 (Basky, 2015). This species occurred more often on the youngest highway section around Budapest. It indicates that propagation materials of *S. alba* (seeds or root fragments) were present more often in the upper soil layer than those of other species.

The horseradish *Armoracia rusticana* P Gaertn., B. Mey. et Scherb. has been cultivated for its root for over 2000 years (Sampliner and Miller, 2009). *Armoracia rusticana* is propagated exclusively vegetatively. Cultivated *A. rusticana* plants are generally sterile. *Armoracia rusticana* is one of the three species in the genus. *A. rusticana* is native to Eastern Europe, *A. macrocarpa* (Waldst. et Kit.) Kit. ex Baumg. 1816 is native to Eastern Europe in marshes of the Central Danube River Basin in Hungary, Czech Republic, former Yugoslavia, Bulgaria, Romania, and Slovakia (Al-Shehbaz, 1988; Marhold and Michalková, 2002; Ančev, 2007) and *A. sisymbrioides* (DC.) Cajander is native to Siberia (Sampliner and Miller, 2009).

Armoracia species have white, four-merous flowers and angustiseptate fruits. Members of the genus prefer wet habitats and commonly spread through rhizomes (Al-Shehbaz, 1988).

Armoracia rusticana can be found in moist habitats, including fields, gardens, weedy areas, farmland, roadsides, ditches and disturbed areas throughout Europe (Al-Shehbaz, 1988).

* E-mail: zsuzsabasky@gmail.com

The aphid genus *Smiela* was erected by Mordvilko 1948 (Doncaster, 1954). Börner (1952a) separated two subgenera: 1 *Lipaphis* sensu stricto (syn. *Lipaphidoides* Börner 1939) type *Lipaphis erysimi* (Kaltenbach, 1843) and 2 *Smiela* Mordvilko 1948 type *S. fusca* Mordvilko 1948. *Lipaphis* sensu stricto contains *rossi* Börner 1939, *turritella* (Wahlgren 1938) and *hedickei* Börner 1952. *L. hedickei* is not a valid species (Remaudière and Remaudière, 2006). All species are associated with cruciferous host plants. Börner applied the name *hedickei* to a species forming galls on sea kale (*Crambe maritima* L. 1753). He included the species *Smiela* on account of its host plant associations. Börner (1952b, c) and Heinze (1960a, b) mentioned two species *Lipaphis* (*Smiela*) *turritella* and *Lipaphis* (*Smiela*) *rossi* Börner (1952a).

Mustață et al. (2000) reported the presence of *Smiela syreniae* Bozhko 1963 from Danube Delta Biosphere Reserve. They published identification key for *Smiela* species: *Smiela fusca* Mordvilko 1948 from *Berteroa incana* (L.) DC. 1821 host plant, *Smiela schneideri* (Hille Ris Lambers 1956), *Smiela schneideri schneideri* (Hille Ris Lambers 1956) from *Isatis glauca* Aucher ex Bois from Syria, *Smiela schneideri alyssi* Mamontova-Solukha 1962 from *Alyssum tortuosum* Willd. 1800 host plant from Crimea, and *Smiela syreniae* Bozhko 1963 from *Erysimum sessiliflorum* R. Br., *Erysimum canescens* Roth 1797 and *Syrenia cana* (Piller et Mitterp.) Neilr. 1870 host plants from Kazakhstan. *Smiela syreniae* was also reported from Russia, Ukraine, Slovakia and Central Asia (Blackman and Eastop, 2006).

Materials and Methods

Aphids were surveyed on host plants from middle of May till the beginning of July in 2011 and 2012 along the 2655.9 km long highway network of Hungary. Thirty-three evenly distributed sampling places were marked along the highways. The sampling places are published in Kiss et al. (2013). Aphids were collected from host plants with fine camel hair brush. The collected aphid individuals were placed into Eppendorf tubes containing 70% ethanol. Location, sampling date and host plant name were recorded on the labels placed into the tubes. Apterous individuals were slide mounted using the method of Szalay-Marzsó (1969). The last step of slide mounting was to dye the cleared individuals according to Kosztarab and Kozár (1978).

Aphids were identified based on the identification keys of Blackman and Eastop (2006), Börner (1952a, b, c), Heinze (1960a, b).

Results and Discussion

Survey of the Hungarian motorways revealed the presence of *Smiela fusca* Mordvilko on the motorway E 5 at Petőfiszállás (Bács-Kiskun county) (46°36'34.4304" N; 19°50'29.7348" E) new species of the Hungarian aphid fauna.

Morphology of Smiela fusca

Aptereae are gray-brown, densely covered with wax powder. Body length: 1.4–1.8 mm. Cornicles are black, volcano-shaped. Cauda is paler; it is light brown on the slide mounted specimens. Cauda shorter than its basal with, triangular shaped with rounded apex. Abdomen pale, needle like hairs with dark tuberculate bases are scattered on the abdomen thorax and head (hairs are situated not in rows). The longest abdominal hairs are 3–5 times longer than base of antenna III. The longest abdominal hairs at least twice as long as the hairs on the head. Out of 8 individuals 2 of them had small round 6–8 hardly visible rhinaria at the base of antenna III. There was no rhinaria on ANT. IV. (Fig. 1).

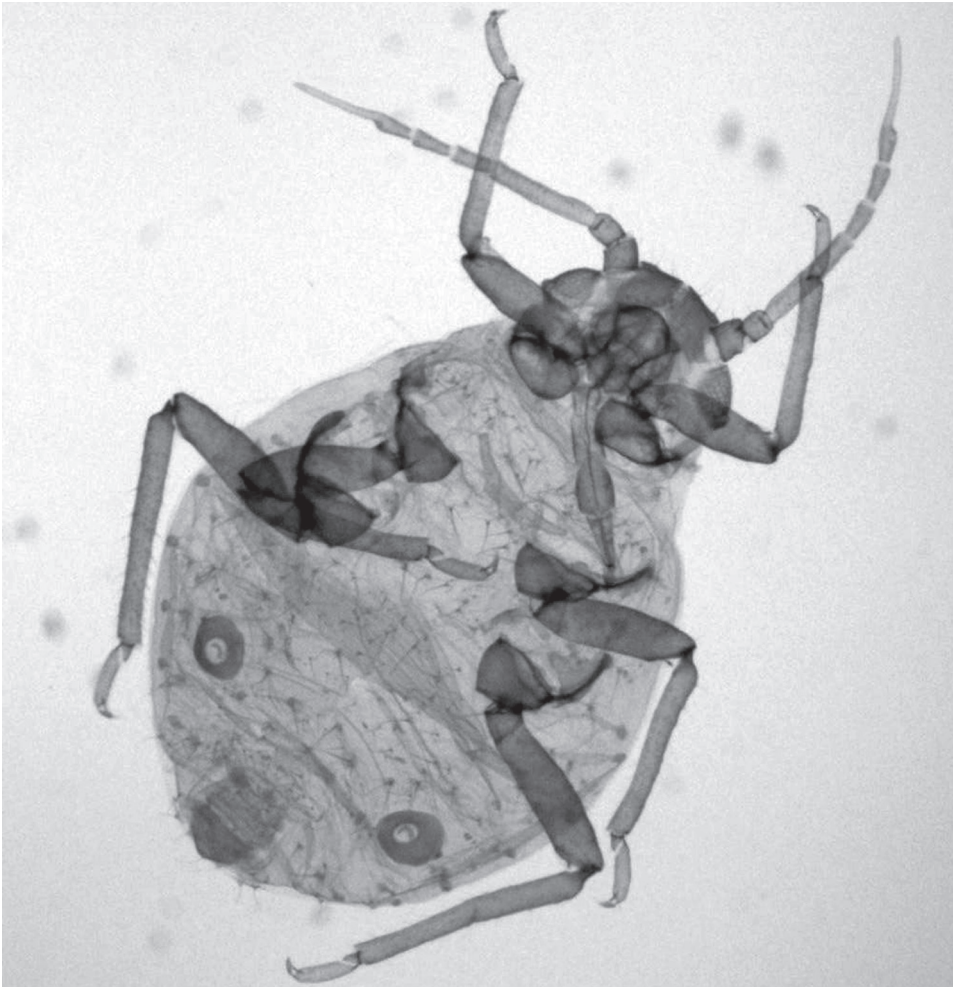


Fig. 1. *Smiela fusca*

Smiela Mordvilko (Aphidinae: Macrosiphini) the genera includes four palearctic crucifer-feeding species related to *Brevicoryne* with broad, dark volcano shaped siphunculi, short cauda (Blackman and Eastop, 2006).

The area of distribution of *Smiela fusca* Mordvilko species is narrow. It is present in Germany, Poland, Czech Republic, Slovakia, Ukraine, Romania and Bulgaria (Nieto Nafria, 2011).

Our regular survey on the Hungarian motorway network revealed the presence of a rare crucifer-feeding aphid species on *A. rusticana*. The horse radish has not been mentioned as host of *Smiela* species. Next year we went back to the location of occurrence of *S. fusca*. We found the perennial horse radish plant, but we were not able to find any *S. fusca* individual in the following year. *Smiela fusca* was mentioned a gall forming aphid on sea kale, *Crambe maritima* (Börner, 1952b, c; Heinze, 1960a, b). There was no sign of gall formation on *A. rusticana* at the feeding site of *S. fusca*. The colony consisted in 8 apterous individuals. Number of nymphs was not recorded, because only adult aphid individuals can be identified.

Here we report *Smiela fusca* not only new record for the Hungarian aphid fauna, but we found *S. fusca* colonizing a new host species *Armoracia rusticana*.

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